

## ABSTRACT

A medical device (110) including a catheter shaft (111) and a unitarily and continuously formed portion (108) having a varying durometer, and optionally including an expandable balloon (18, 118). One or both of the unitarily and continuously formed portion (108) and the balloon (18, 118) are made from an irradiation cross-linked or cross-linkable mixture of a polyamide elastomer and at least one additional cross-linking reactant. The polyamide elastomer can be a polyester amide, a polyether ester amide or a polyether amide, and is preferably a nylon block copolymer. The aromatic molecule can be 1,3,5 triethyl benzene; 1,2,4 triethyl benzene; and 1,3,5 triisopropyl benzene. The cross-linking reactant can be: (a) a difunctional material, (b) a trifunctional material, (c) a tetrafunctional material, or (d) an aromatic molecule containing at least two ring substituents, each of the ring substituents having labile hydrogens at a benzylic site therein. The cross-linking reactant can also be diallyl phthalate or meta-phenylene dimaleimide.